Summary of Sequoia and King's Canyon National Park's GRI meeting September 23-24, 2002

SUMMARY

A Geologic Resources Inventory (GRI) workshop was held for Sequoia and Kings Canyon National Parks (SEKI) on September 23rd and 24th, 2002. The purpose was to view and discuss the park's geologic resources, to address the status of geologic mapping for compiling both paper and digital maps, and to assess resource management issues and needs. Cooperators from the NPS Geologic Resources Division (GRD), SEKI, The University of North Carolina, and the United States Geologic Survey (USGS) were present for the workshop.

The workshop involved field trips to various points of interest in SEKI, led by Jim Moore and Tom Sisson of the USGS, as well as another half-day scoping session to present overviews of the NPS Inventory and Monitoring (I&M) program, the GRD, and the on-going GRI. Round table discussions involving geologic issues for SEKI included the status of geologic mapping efforts, interpretation, sources of available data, and action items generated from this meeting.

For a list of meeting attendees, see **Appendix A (List of attendees for Sequoia-King's Canyon NP's GRI Workshop, September 23-24, 2002).**

OVERVIEW OF GEOLOGIC RESOURCES INVENTORY (GRI)

The NPS GRI has the following goals for some 273 units with significant natural resources:

1) To assemble a bibliography ("***GRBIB***") of known geological publications to compile and evaluate a list of existing geologic maps for each unit,
2) To conduct a scoping session for each park,
3) To develop digital geologic map products for use in a GIS (geographic information system), and
4) To complete a geologic report that synthesizes much of the existing geologic knowledge about each park.

It is stressed that the emphasis of the inventory is not to routinely initiate new geologic mapping projects, but to aggregate existing "baseline" information and identify where serious geologic data needs and issues exist in the National Park System. In cases where map coverage is nearly complete (ex. 4 of 5 quadrangles for Park "X") or maps simply do not exist, then funding may be available for geologic mapping.

After introductions by the participants, Bruce Heise (NPS-GRD) presented overviews of the Geologic Resources Division, the NPS I&M Program, the status of the Natural Resource Inventories, and the Geologic Resource Inventory in particular.

Joe Gregson (NPS-NRID) presented a demonstration of some of the main features of the digital geologic database for the Black Canyon of the Gunnison NP and Curecanti NRA in Colorado. This has become the prototype for the NPS digital geologic map model as it reproduces all aspects of a paper map (i.e. it incorporates the map notes, cross sections, legend etc.) with the added benefit of being geospatially referenced. It is displayed in ESRI ArcView shape files and features a built-in Microsoft Windows help file system to identify the map units. It can also display scanned JPG or GIF images of

the geologic cross sections supplied with the paper "analog" map. Geologic cross section lines (ex. A-A') are subsequently digitized as a line coverage and are hyperlinks to the scanned images.

GRBIB

At the scoping session, individual Microsoft Word Documents of Geologic Bibliographies for SEKI were distributed.

The sources for this complied information are as follows:

- AGI (American Geological Institute) GeoRef
- USGS GeoIndex
- ProCite information taken from specific NPS park libraries

These bibliographic compilations were validated by GRI staff to eliminate duplicate citations, typographical errors, and as well as to check for applicability to the specific park. After validation, they become part of a Microsoft Access database parsed into columns bases on park, author, year of publication, title, publisher, publication number, and a miscellaneous column for notes.

For the Access database, they are exported as Microsoft Word Documents for easier readability, and eventually turned into PDF documents. They are then posted to the GRI website at: http://www2.nature.nps.gov/grd/geology/gri/products/geobib/ for general viewing.

EXISTING GEOLOGIC MAPS

After the bibliographies were assembled, a separate search was made for any existing surficial and bedrock geologic maps for SEKI. The entire park, with the exception of a small southwest portion, called the "***Kaweah strip***", has been mapped at *1:125,000* scale and digitized by the USGS. Four additional "quadrangles of interest" that need to be completed are ***Silver City, Mineral King, Moses Mountain, and Quinn Peak***. The Kaweah strip consists of portions of the Case Mountain, Dennison Peak, and Kaweah quadrangles that contain parts of the SEKI boundary. Jim Moore and Tom Sisson of the USGS would be able to complete these areas in two field seasons-preferably FY-2004 and FY-2005.

See **Appendix B (*SEKI Quadrangles of Interest and available digital geology*).**

FUNDING

NPS and USGS will work together on funding for the completion of the SEKI area. SEKI staff will submit a statement into PMIS (project management information systems) and send a TA (technical assistance request) to GRD.

MANAGEMENT NEEDS PERTAINING TO FUTURE GEOLOGIC RESEARCH

Desired Research Projects

- Soils
- Completion of the SEKI geologic map with the Kaweah strip
- Karst hydrology

- Dating of geologic units
- Active glaciers/permanent snowfields
- Rock glaciers
- Detailed mapping of glacial deposits (esp. South fork and middle fork of King's Canyon)
- Aeromagnetic over parks (surrounding information available)
- GPS monitoring of active tectonics (define and revisit benchmarks)
- High resolution elevation data to map sinkholes
- Rare plants/vegetation vs. geologic relationships
- Sediment transport
- Active fault identification
- Sediment deposition relating to catastrophic fires

Issues/Hazards

- Communicating research needs
- Rain on snow floods
- Rock-fall
- Earthquakes/poor seismic monitoring
- Active volcanic processes in the area

GEOLOGIC REPORTS

Exploring the Highest Sierra, written by Jim Moore, provides an excellent report on the entire SEKI area. (Moore James C., 2000, Exploring the Highest Sierra, Stanford University Press, Stanford, California, 427 pages.)

INTERPRETATION

During the scoping session, park resource managers showed interest in using the geologic maps for various interpretive examples throughout the park.

Appendix A: List of attendees for Sequoia-King's Canyon NP's GRI Workshop
September 23-24, 2002

LAST NAME	FIRST NAME	TYPE	AFFILIATION	TITLE	PHONE	E-MAIL	Field Trip	Scoping Session
Allen	Lindy	federal	NPS-GRD	admin. assistant	303-969-2090	lindy_allen@nps.gov	yes	yes
Bumgardner	Steve	other		videographer	559-565-3949	s_bumgardner@hotmail.com	yes	yes
Connors	Tim	federal	NPS, Geologic Resources Division	geologist	(303) 969-2093	Tim_Connors@nps.gov	no	no
Despain	Joel	federal	NPS-SEKI	cave specialist	559-565-3717	joel_despain@nps.gov	yes	Yes
Esperanza	Annie	federal	NPS-SEKI	branch chief	559-265-3777	annie_esperanza@nps.gov	no	Yes
Fryer	Larry	other					yes	No
Fryer	Shane	federal	SEKI	cave specialist	559-565-4271	shane_fryer@nps.gov	Yes	Yes
Glazner	Allan	academic	University of North Carolina at Chapel Hill	professor	919-962-0689	afg@unc.edu	Yes	Yes
Graber	Dave	federal	NPS-SEKI	science advisor	559-565-3173	david_graber@nps.gov	No	Yes
Gregson	Joe	federal	NPS, Natural Resources Information Division	physical scientist	(970) 225-3559	Joe_Gregson@nps.gov	Yes	Yes
Heise	Bruce	federal	NPS, Geologic Resources Division	geologist	(303) 969-2017	Bruce_Heise@nps.gov	yes	Yes
Lineback	Pat	federal	NPS-SEKI	GIS	559-565-3725	pat_lineback@nps.gov	No	Yes
Moore	Jim	federal	USGS	geologist	650-329-5244	jmoore@usgs.gov	yes	Yes
Murchey	Bonnie	federal	USGS	geologist	650-329-4926	bmurchey@usgs.gov	yes	Yes
Mutch	Linda	federal	NPS, Sierra Nevada Network	ecologist	559-565-3174	linda_mutch@nps.gov	Yes	Yes
Satnat	Becky	federal	NPS, SEKI	education coordinator		becky_satnat@nps.gov	Yes	No
Sisson	Tom	federal	USGS	geologist	650-329-5247	tsisson@usgs.gov	Yes	Yes
Snow	Abbey	other	Sequoia NHA				Yes	No
Stock	Greg	academic	UC Santa Cruz	geologist	831-459-2551	gstock@es.ucsc.edu	Yes	Yes
Wives	Sara	other					Yes	No

Appendix B: SEKI quadrangles of interest and available digital geology